

SEQUENCE LISTING

<110> Simmons, Carl R.

<120> Nucleic Acids Encoding Defense Inducible
Proteins and Uses Thereof

<130> 35718/242990

<141> 02/28/2002

<150> 60/272,227

<151> 02/28/2001

<160> 25

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 676

<212> DNA

<213> Zea mays

<220>

<221> CDS

<222> (89)...(367)

<400> 1

accacgcgt cgcgccacgc gtccgcagca atccacacaa gcacttcgaa ggaccactgc 60

tcggaggaca caccaagcgt ctgcacca atg gct tac tac cag gag gtg gac 112

Met Ala Tyr Tyr Gln Glu Val Asp

1

5

tac tgc tcg gag gag gtg agg tcg gtg gcc ccg gcc ggc ttc ggc cgc 160

Tyr Cys Ser Glu Glu Val Arg Ser Val Ala Pro Ala Gly Phe Gly Arg

10

15

20

cac ggc ggc ggc gtc cag cag cac gtc gtc aag gag aag ttc gag gag 208

His Gly Gly Gly Val Gln Gln His Val Val Lys Glu Lys Phe Glu Glu

25

30

35

40

gtc gac acg gta tca cgc gcc ggc gcc aac cac cac cac cat ggt 256

Val Asp Thr Val Ser Arg Ala Gly Ala Asn His His His His His Gly

45

50

55

cac cac ggc ggc cac ggc ttc gtg gtg cgc gag acc agg gtc gag gag 304

His His Gly Gly His Gly Phe Val Val Arg Glu Thr Arg Val Glu Glu

60

65

70

gac atc aac acc tgc acc ggc gag gtc cac gag cgc agg gag agc ttc 352

Asp Ile Asn Thr Cys Thr Gly Glu Val His Glu Arg Arg Glu Ser Phe

75

80

85

ctc gcc agg gct aac tgagccgccc ggcgggccggc atccacgccc gttcgtgctt 407
 Leu Ala Arg Ala Asn
 90

gcctgcgtgc cttatgtatg tctgtggttg actggttggtg caggggtcatc gtacttggct 467
 atcgtacgtg cagcactca gtcctgtac gaattacgac aataagctcg tgacctgaat 527
 aaaacttctt cgtaatacta atacctacat caaaaaaaaa aaaaaaaaaa aaaaaaaaaa 587
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 647
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 676

<210> 2
 <211> 93
 <212> PRT
 <213> Zea mays

<400> 2
 Met Ala Tyr Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser
 1 5 10 15
 Val Ala Pro Ala Gly Phe Gly Arg His Gly Gly Gly Val Gln Gln His
 20 25 30
 Val Val Lys Glu Lys Phe Glu Glu Val Asp Thr Val Ser Arg Ala Gly
 35 40 45
 Ala Asn His His His His His Gly His His Gly Gly His Gly Phe Val
 50 55 60
 Val Arg Glu Thr Arg Val Glu Glu Asp Ile Asn Thr Cys Thr Gly Glu
 65 70 75 80
 Val His Glu Arg Arg Glu Ser Phe Leu Ala Arg Ala Asn
 85 90

<210> 3
 <211> 574
 <212> DNA
 <213> Zea mays

<220>
 <221> CDS
 <222> (96)...(374)

<400> 3
 acccaegcgt ccgcccacgc gtccgcacag caatccacac aagcacttcg acgtcacacg 60
 ggcgctgcgc acagacacac caagcgctcgg cacca atg gct tac tac cag gag 113
 Met Ala Tyr Tyr Gln Glu
 1 5

gtg gac tac tgc tcg gag gag gtg agg tcg gtg gcc ccg gcc ggc ttc 161
 Val Asp Tyr Cys Ser Glu Glu Val Arg Ser Val Ala Pro Ala Gly Phe
 10 15 20

ggc cgc cac ggc ggc ggc gtc cag cag cac gtc gtc aag gag aag ttc 209
 Gly Arg His Gly Gly Gly Val Gln Gln His Val Val Lys Glu Lys Phe
 25 30 35

gag gag gtc gac acg gtc tca cgc gcc ggc gcc aac cac cac cac cac 257
 Glu Glu Val Asp Thr Val Ser Arg Ala Gly Ala Asn His His His His
 40 45 50

cat ggt cac cac ggc ggc cac ggc ttc gtg gtg cgc gag acc agg gtc 305
His Gly His His Gly Gly His Gly Phe Val Val Arg Glu Thr Arg Val
55 60 65 70

gaa gag gac atc aac acc tgc acc ggc gag gtc cac gag cgc agg gag 353
Glu Glu Asp Ile Asn Thr Cys Thr Gly Glu Val His Glu Arg Arg Glu
75 80 85

agc ttc ctc gcc agg gct aac tgagccgccc ggcgccgggc atccacgccc 404
Ser Phe Leu Ala Arg Ala Asn
90

gttcgtgctt gcctgcgtgc cttatgtatg tctgtggttg actggttggtt cagggtcatc 464
gtacttggtt atcgtacgtg cacgcactca gtcctgttac gaattacgac aataagctcg 524
tgacctgaat aaaacttctt cgtaatacta aaaaaaaaaa aaaaaaaaaa 574

<210> 4
<211> 93
<212> PRT
<213> Zea mays

<400> 4
Met Ala Tyr Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser
1 5 10 15
Val Ala Pro Ala Gly Phe Gly Arg His Gly Gly Gly Val Gln Gln His
20 25 30
Val Val Lys Glu Lys Phe Glu Glu Val Asp Thr Val Ser Arg Ala Gly
35 40 45
Ala Asn His His His His His Gly His His Gly Gly His Gly Phe Val
50 55 60
Val Arg Glu Thr Arg Val Glu Glu Asp Ile Asn Thr Cys Thr Gly Glu
65 70 75 80
Val His Glu Arg Arg Glu Ser Phe Leu Ala Arg Ala Asn
85 90

<210> 5
<211> 577
<212> DNA
<213> Zea mays

<220>
<221> CDS
<222> (99)...(377)

<400> 5
tcgacccacg cgtccgcccga cgcgtccgca cagcaatcca cacaagcact tcgacgtcac 60
acggggcgctg cgcacagaca caccaagcgt cggcacca atg gct tac tac cag gag 116
Met Ala Tyr Tyr Gln Glu
1 5

gtg gac tac tgc tcg gag gag gtg agg tcg gtg gcc ccg gcc ggc ttc 164
Val Asp Tyr Cys Ser Glu Glu Val Arg Ser Val Ala Pro Ala Gly Phe
10 15 20

ggc cgc cac ggc ggc ggc gtc cag cag cac gtc gtc aag gag aag ttc 212
Gly Arg His Gly Gly Gly Val Gln Gln His Val Val Lys Glu Lys Phe
25 30 35

gag gag gtc gac acg gtc tca cgc gcc ggc gcc aac cac cac cac cac 260
 Glu Glu Val Asp Thr Val Ser Arg Ala Gly Ala Asn His His His His
 40 45 50

cat ggt cac cac ggc ggc cac ggc ttc gtg gtg cgc gag acc agg gtc 308
 His Gly His His Gly Gly His Gly Phe Val Val Arg Glu Thr Arg Val
 55 60 65 70

gaa gag gac atc aac acc tgc acc ggc gag gtc cac gag cgc agg gag 356
 Glu Glu Asp Ile Asn Thr Cys Thr Gly Glu Val His Glu Arg Arg Glu
 75 80 85

agc ttc ctc gcc agg gct aac tgagccgccc ggcggccggc atccacgccc 407
 Ser Phe Leu Ala Arg Ala Asn
 90

gttcgtgctt gacctgctgc cttatgtatg tctgtggttg actggttggtt cagggtcatc 467
 gtacttggtt atcgtagtg cacgcactca gctcctgtac gaattacgac aataagctcg 527
 tgacctgaat aaaacttctt cgtaatacta aaaaaaaaaa aaaaaaaaaa 577

<210> 6
 <211> 93
 <212> PRT
 <213> Zea mays

<400> 6
 Met Ala Tyr Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser
 1 5 10 15
 Val Ala Pro Ala Gly Phe Gly Arg His Gly Gly Gly Val Gln Gln His
 20 25 30
 Val Val Lys Glu Lys Phe Glu Glu Val Asp Thr Val Ser Arg Ala Gly
 35 40 45
 Ala Asn His His His His His Gly His His Gly Gly His Gly Phe Val
 50 55 60
 Val Arg Glu Thr Arg Val Glu Glu Asp Ile Asn Thr Cys Thr Gly Glu
 65 70 75 80
 Val His Glu Arg Arg Glu Ser Phe Leu Ala Arg Ala Asn
 85 90

<210> 7
 <211> 580
 <212> DNA
 <213> Zea mays

<220>
 <221> CDS
 <222> (99)...(380)

<400> 7
 tcgacccacg cgtccgcca cgcgtccgca cagcaatcca cacaagcact tcgacgtcgc 60
 acgggctgctg cacacagaca caccaagcgt cggcacca atg gct tac tac cag gag 116
 Met Ala Tyr Tyr Gln Glu
 1 5

gtg gac tac tgc tcg gag gag gtg agg tcg gtg gcc ccg gcc ggc ttc 164
 Val Asp Tyr Cys Ser Glu Glu Val Arg Ser Val Ala Pro Ala Gly Phe

005520-50000

10	15	20	
ggc cgc cac gga ggc ggc gtc cag cag cac gtc gtc aag gag aag ttc			212
Gly Arg His Gly Gly Gly Val Gln Gln His Val Val Lys Glu Lys Phe			
25	30	35	
gag gag gtc gac acg gtc tca cgc gcc ggc gcc aac cac cac cac cac			260
Glu Glu Val Asp Thr Val Ser Arg Ala Gly Ala Asn His His His His			
40	45	50	
cac cat ggt cac cac ggc ggc cac ggc ttc gtg gtg cgc gag acc agg			308
His His Gly His His Gly Gly His Gly Phe Val Val Arg Glu Thr Arg			
55	60	65	70
gtc gag gag gac atc aac acc tgc acc ggc gag gtc cac gag cgc agg			356
Val Glu Glu Asp Ile Asn Thr Cys Thr Gly Glu Val His Glu Arg Arg			
75	80	85	
gag agc ttc ctc gcc agg gct aac tgagccgccc ggcggccggc atccacgccc			410
Glu Ser Phe Leu Ala Arg Ala Asn			
90			
gttcgtgcct gcctgcgtgc cttatgtatg tctgtggttg actggttggtg caggggtcatc			470
gtacttggct atcgtacgtg cacgcactca gtcctgtac gaattacgac aataagctcg			530
tgacctgaat aaaacttctt cgtaatacta aaaaaaaaaa aaaaaaaaaa			580
<210> 8			
<211> 94			
<212> PRT			
<213> Zea mays			
<400> 8			
Met Ala Tyr Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser			
1	5	10	15
Val Ala Pro Ala Gly Phe Gly Arg His Gly Gly Gly Val Gln Gln His			
20	25	30	
Val Val Lys Glu Lys Phe Glu Glu Val Asp Thr Val Ser Arg Ala Gly			
35	40	45	
Ala Asn His His His His His His Gly His His Gly Gly His Gly Phe			
50	55	60	
Val Val Arg Glu Thr Arg Val Glu Glu Asp Ile Asn Thr Cys Thr Gly			
65	70	75	80
Glu Val His Glu Arg Arg Glu Ser Phe Leu Ala Arg Ala Asn			
85	90		
<210> 9			
<211> 529			
<212> DNA			
<213> Zea mays			
<220>			
<221> CDS			
<222> (53)...(331)			
<400> 9			
agcggcgggg aagaagggt acaagatgaa gacgcacaag gcgtcggcac ca atg gct			58
		Met Ala	

tac tac cag gag gtg gac tac tgc tgc gag gag gtg agg tgc gtg gcc 106
Tyr Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser Val Ala
5 10 15

ccg gcc ggc ttc ggc cgc cac ggc ggc ggc gtc cag cag cac gtc gtc 154
Pro Ala Gly Phe Gly Arg His Gly Gly Gly Val Gln Gln His Val Val
20 25 30

aag gag aag ttc gag gag gtc gac acg gtc gca cgc gcc ggc gcc aac 202
Lys Glu Lys Phe Glu Glu Val Asp Thr Val Ala Arg Ala Gly Ala Asn
35 40 45 50

cac cac cac cac cat ggt cac cac ggc ggc cac ggc ttc gtg gtg cgc 250
His His His His His Gly His His Gly Gly His Gly Phe Val Val Arg
55 60 65

gag acc agg gtc gag gag gac atc aac acc tgc acc ggc gag gtc cac 298
Glu Thr Arg Val Glu Glu Asp Ile Asn Thr Cys Thr Gly Glu Val His
70 75 80

gag cgc agg gag agc ttc ctc gcc agg gct aac tgagcagccc gggcggccgg 351
Glu Arg Arg Glu Ser Phe Leu Ala Arg Ala Asn
85 90

catccacgcc cgcttcgtgcc tgcttcgctg ccttatgtat gtctgtgatt gtgcagggtc 411
atcgtacttg gctagcgtac gtgcacgcac tcagctcctg tacgaattac gataataagc 471
tcgtgacctg aataaaaactt cttcgtaata ctaataccta aaaaaaaaaa aaaaaaaaaa 529

<210> 10
<211> 93
<212> PRT
<213> Zea mays

<400> 10
Met Ala Tyr Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser
1 5 10 15
Val Ala Pro Ala Gly Phe Gly Arg His Gly Gly Gly Val Gln Gln His
20 25 30
Val Val Lys Glu Lys Phe Glu Glu Val Asp Thr Val Ala Arg Ala Gly
35 40 45
Ala Asn His His His His His Gly His His Gly Gly His Gly Phe Val
50 55 60
Val Arg Glu Thr Arg Val Glu Glu Asp Ile Asn Thr Cys Thr Gly Glu
65 70 75 80
Val His Glu Arg Arg Glu Ser Phe Leu Ala Arg Ala Asn
85 90

<210> 11
<211> 22
<212> DNA
<213> Zea mays

<400> 11
gcaccaatgg cttactacca gg

<210> 12
 <211> 19
 <212> DNA
 <213> Zea mays

<400> 12
 cgggcggctc agttagccc

19

<210> 13
 <211> 348
 <212> DNA
 <213> Oryza sativa

<220>
 <221> CDS
 <222> (52)...(348)

<221> misc_feature
 <222> (1)...(348)
 <223> n = A,T,C or G

<400> 13
 atttctcgct catcacaaca ccacctcacc tcactcccca actaaaaaac a atg gct
 Met Ala
 1

57

cac tac cag gag gtg gac tac tgc tcg gag gag gtg agg tcg gtg acc
 His Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser Val Thr
 5 10 15

105

ccc acc ggc ggc ttc ctc ggc cgc ggc ggc gtg cag cag cag cac gtc
 Pro Thr Gly Gly Phe Leu Gly Arg Gly Gly Val Gln Gln Gln His Val
 20 25 30

153

gtc aag gag acg ttc cag gag atc gac ang tcc ggc tcc ggc cgg can
 Val Lys Glu Thr Phe Gln Glu Ile Asp Xaa Ser Gly Ser Gly Arg Xaa
 35 40 45 50

201

can cac aac cac aac cac ggc aac gac tac ctn atg gtg cgc gag acc
 Xaa His Asn His Asn His Gly Asn Asp Tyr Xaa Met Val Arg Glu Thr
 55 60 65

249

aag gtn gag gag gac ttt aac acc tgc acc ggc gag ttt cgc gag cgc
 Lys Xaa Glu Glu Asp Phe Asn Thr Cys Thr Gly Glu Phe Arg Glu Arg
 70 75 80

297

aan aag gag ctt tcc tgc tna agt ccg act tna tcg aac ctg ctg tgt
 Xaa Lys Glu Leu Ser Cys Xaa Ser Pro Thr Xaa Ser Asn Leu Leu Cys
 85 90 95

345

gta
 Val

348

<210> 14
 <211> 99

<212> PRT
 <213> Oryza sativa

<220>
 <221> VARIANT
 <222> (1)...(99)
 <223> Xaa = Any Amino Acid

<400> 14
 Met Ala His Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser
 1 5 10 15
 Val Thr Pro Thr Gly Gly Phe Leu Gly Arg Gly Gly Val Gln Gln Gln
 20 25 30
 His Val Val Lys Glu Thr Phe Gln Glu Ile Asp Xaa Ser Gly Ser Gly
 35 40 45
 Arg Xaa Xaa His Asn His Asn His Gly Asn Asp Tyr Xaa Met Val Arg
 50 55 60
 Glu Thr Lys Xaa Glu Glu Asp Phe Asn Thr Cys Thr Gly Glu Phe Arg
 65 70 75 80
 Glu Arg Xaa Lys Glu Leu Ser Cys Xaa Ser Pro Thr Xaa Ser Asn Leu
 85 90 95
 Leu Cys Val

<210> 15
 <211> 591
 <212> DNA
 <213> Oryza sativa

<220>
 <221> CDS
 <222> (61)...(333)
 <221> misc_feature
 <222> (1)...(591)
 <223> n = A,T,C or G

<400> 15
 taattaacca tttctcgctc atcacaacac cacctcacct cactcccca ctaaaaaaca 60
 atg gct cac tac cag gag gtg gac tac tgc tcg gag gag gtg agg tcg 108
 Met Ala His Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser
 1 5 10 15
 gtg acc ccc acc ggc ggc ttc ctc ggc cgc ggc ggc gtg cag cag cag 156
 Val Thr Pro Thr Gly Gly Phe Leu Gly Arg Gly Gly Val Gln Gln Gln
 20 25 30
 cac gtc gtc aag gag acg ttc cag gag atc gac agg tcc ggc tcc ggc 204
 His Val Val Lys Glu Thr Phe Gln Glu Ile Asp Arg Ser Gly Ser Gly
 35 40 45
 cgc cac cac cac aac cac aac cac ggc aac gac tac ctg atg gtg cgc 252
 Arg His His His Asn His Asn His Gly Asn Asp Tyr Leu Met Val Arg
 50 55 60
 gag acc aag gtg gag gag gac ttc aac acc tgc acc ggc gag ttc cgc 300
 Glu Thr Lys Val Glu Glu Asp Phe Asn Thr Cys Thr Gly Glu Phe Arg

65

70

75

80

gag cgc aag cag agc ttc ctg ctc aag tcc gac tgatcgaacc tgctgtgtgt 353
 Glu Arg Lys Gln Ser Phe Leu Leu Lys Ser Asp

85

90

acccgtgtac gtacgtacgt atatgtgtgc ccgtacgtag tcgtggtggt catgtggtgg 413
 cttagctcta cgtgtatata gtgcgtgctg gtgtacgtgc gtacacggag cttagctaata 473
 tagcaccttc ttcctgtgc gattactacg aacggagagg gggggtgtat gaaaaataat 533
 tcgtgacctg atatataanc tgyctaatac acggtaaaaa aaaaaaaaaa aaagaaaa 591

<210> 16

<211> 91

<212> PRT

<213> Oryza sativa

<400> 16

Met Ala His Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser
 1 5 10 15
 Val Thr Pro Thr Gly Gly Phe Leu Gly Arg Gly Gly Val Gln Gln Gln
 20 25 30
 His Val Val Lys Glu Thr Phe Gln Glu Ile Asp Arg Ser Gly Ser Gly
 35 40 45
 Arg His His His Asn His Asn His Gly Asn Asp Tyr Leu Met Val Arg
 50 55 60
 Glu Thr Lys Val Glu Glu Asp Phe Asn Thr Cys Thr Gly Glu Phe Arg
 65 70 75 80
 Glu Arg Lys Gln Ser Phe Leu Leu Lys Ser Asp
 85 90

<210> 17

<211> 524

<212> DNA

<213> Triticum aestivum

<220>

<221> CDS

<222> (57)...(338)

<221> misc_feature

<222> (1)...(524)

<223> n = A,T,C or G

<400> 17

caagcacttc gacgtcgcac gggcgctgca cacagacaca ccaagcgtcg gcacca atg 59
 Met
 1

gct tac tac cag gag gtg gac tac tgc tcg gag gag gtg agg tcg gtg 107
 Ala Tyr Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser Val
 5 10 15

gcc ccg gcc ggc ttc ggc cgc cac gga ggc ggc gtc cag cag cac gtc 155
 Ala Pro Ala Gly Phe Gly Arg His Gly Gly Gly Val Gln Gln His Val
 20 25 30

gtc aag gag aag ttc gag gag gtc gac acg gtc tca cgc gcc gcc gcc 203

Val Lys Glu Lys Phe Glu Glu Val Asp Thr Val Ser Arg Ala Gly Ala
 35 40 45

aac cac cac cac cac cat ggt cac cac ggc ggc cac ggc ttc gtg 251
 Asn His His His His His His Gly His His Gly Gly His Gly Phe Val
 50 55 60 65

gtg cgc gag acc agg gtc gag gag gac atc aac acc tgc acc ggc gag 299
 Val Arg Glu Thr Arg Val Glu Glu Asp Ile Asn Thr Cys Thr Gly Glu
 70 75 80

gtc cac gag cgc agg gag agc ttc ctc gcc agg gct aac tgagccgccc 348
 Val His Glu Arg Arg Glu Ser Phe Leu Ala Arg Ala Asn
 85 90

ggcgcccgcc atccacgccc gttcgtgcct gcctgcgtgc cytatstatg tctgtggttg 408
 actggttggtg caaggtcatc ntacttggct atcgtagts mascactcrs tctgtmcaa 468
 ttacacaata rctcctgacc tgaataaaac tctcstatac taaaaaaaaa araaaa 524

<210> 18
 <211> 94
 <212> PRT
 <213> Triticum aestivum

<400> 18
 Met Ala Tyr Tyr Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ser
 1 5 10 15
 Val Ala Pro Ala Gly Phe Gly Arg His Gly Gly Gly Val Gln Gln His
 20 25 30
 Val Val Lys Glu Lys Phe Glu Glu Val Asp Thr Val Ser Arg Ala Gly
 35 40 45
 Ala Asn His His His His His Gly His His Gly Gly His Gly Phe
 50 55 60
 Val Val Arg Glu Thr Arg Val Glu Glu Asp Ile Asn Thr Cys Thr Gly
 65 70 75 80
 Glu Val His Glu Arg Arg Glu Ser Phe Leu Ala Arg Ala Asn
 85 90

<210> 19
 <211> 584
 <212> DNA
 <213> Triticum aestivum

<220>
 <221> CDS
 <222> (46)...(321)

<221> misc_feature
 <222> (1)...(584)
 <223> n = A,T,C or G

<400> 19
 aacgcacgaa acatacacia aacccaagca catcagtaga tcggc atg gcg cac ttc 57
 Met Ala His Phe
 1

cag gag gtg gac tac tgc tcg gag gag gtg agg gcg gtg ggc tac ccg 105

Gln	Glu	Val	Asp	Tyr	Cys	Ser	Glu	Glu	Val	Arg	Ala	Val	Gly	Tyr	Pro	
5					10					15					20	
gcc	cgc	cgc	ggc	tgc	ggc	ggc	gtg	cag	gag	cac	atc	gtc	aag	gag	acg	153
Ala	Arg	Arg	Gly	Cys	Gly	Gly	Val	Gln	Glu	His	Ile	Val	Lys	Glu	Thr	
			25						30					35		
ttc	gtg	cag	gag	ttc	gac	acc	gcc	ggc	cgc	cgc	cay	ggc	cac	cac	ggc	201
Phe	Val	Gln	Glu	Phe	Asp	Thr	Ala	Gly	Arg	Arg	Xaa	Gly	His	His	Gly	
			40					45					50			
cac	cac	ggc	cgy	ggc	tcy	ggc	cac	ttc	gag	gtg	cgc	gag	agc	aag	cts	249
His	His	Gly	Xaa	Gly	Xaa	Gly	His	Phe	Glu	Val	Arg	Glu	Ser	Lys	Xaa	
			55				60						65			
gar	gag	gac	atc	aac	acc	cgc	acc	ggs	gag	ttc	cac	gaa	cgc	aag	gga	297
Xaa	Glu	Asp	Ile	Asn	Thr	Arg	Thr	Xaa	Glu	Phe	His	Glu	Arg	Lys	Gly	
			70				75						80			
aay	ttc	tcs	tcc	aag	gcc	gat	gac	trasytwaac	ayttmcggac	acactacatg						351
Xaa	Phe	Xaa	Ser	Lys	Ala	Asp	Asp									
			85				90									
tgtgtawatt	mygsattcaa	mattatatgt	atgtkktkatg	ttkcccamat	ccywtacctt											411
tgcaagctkc	cttyttggcg	gsaacaaccc	yatygtgesc	csttcaacct	taataancct											471
ancntgaaca	gataaactnc	tgatagtnnt	aaaaaaagg	ggccgtacca	atcgctatat											531
ggtcttttagc	cctncggcgt	cgttnccactc	tnctggaaan	ctggtacact	tan											584

<210> 20
 <211> 92
 <212> PRT
 <213> Triticum aestivum

<400> 20
 Met Ala His Phe Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ala
 1 5 10 15
 Val Gly Tyr Pro Ala Arg Arg Gly Cys Gly Gly Val Gln Glu His Ile
 20 25 30
 Val Lys Glu Thr Phe Val Gln Glu Phe Asp Thr Ala Gly Arg Arg His
 35 40 45
 Gly His His Gly His His Gly Arg Gly Ser Gly His Phe Glu Val Arg
 50 55 60
 Glu Ser Arg Leu Glu Glu Asp Ile Asn Thr Arg Thr Gly Glu Phe His
 65 70 75 80
 Glu Arg Lys Glu Asn Phe Val Val Arg Ala Asp Asp
 85 90

<210> 21
 <211> 436
 <212> DNA
 <213> Triticum aestivum

<220>
 <221> CDS
 <222> (54)...(326)
 <400> 21

agcaccaaca cacacaaacc caaccaagca catagtaaca tcgaccgacg ggc atg 56
Met
1

gcg cac ttc cag gag gtg gac tac tgc tcg gag gag gtg agg gcg gtg 104
Ala His Phe Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ala Val
5 10 15

ggc aac ccg gcc cgc cgc ggc ggc ggc gtg cag gag cac atc gtc aag 152
Gly Asn Pro Ala Arg Arg Gly Gly Gly Val Gln Glu His Ile Val Lys
20 25 30

gag acg ttc gtg cag gag ttc gac acc tcc ggc cgc cgc cac ggt cac 200
Glu Thr Phe Val Gln Glu Phe Asp Thr Ser Gly Arg Arg His Gly His
35 40 45

cac ggt cac cac ggc cgc ggc tct ggt cac ttc gag gtg cgc gag agc 248
His Gly His His Gly Arg Gly Ser Gly His Phe Glu Val Arg Glu Ser
50 55 60 65

agg ctc gag gag gac ttc aac acc cgc acc ggg gag ttc cac gag cgc 296
Arg Leu Glu Glu Asp Phe Asn Thr Arg Thr Gly Glu Phe His Glu Arg
70 75 80

aag gag aac ttc gtc gtc agg gcc gat gac tgagcttaca cgtaacggag 346
Lys Glu Asn Phe Val Val Arg Ala Asp Asp
85 90

cacactacga tgtgtgtata tgtatgcatg tcagcagtat atgtatgtgt gatgttgcg 406
acagtcgtat agcgtatgca ggcgtgcgtg 436

<210> 22

<211> 91

<212> PRT

<213> Triticum aestivum

<400> 22

Met Ala His Phe Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ala
1 5 10 15
Val Gly Asn Pro Ala Arg Arg Gly Gly Gly Val Gln Glu His Ile Val
20 25 30
Lys Glu Thr Phe Val Gln Glu Phe Asp Thr Ser Gly Arg Arg His Gly
35 40 45
His His Gly His His Gly Arg Gly Ser Gly His Phe Glu Val Arg Glu
50 55 60
Ser Arg Leu Glu Glu Asp Phe Asn Thr Arg Thr Gly Glu Phe His Glu
65 70 75 80
Arg Lys Glu Asn Phe Val Val Arg Ala Asp Asp
85 90

<210> 23

<211> 584

<212> DNA

<213> Triticum aestivum

<220>

<221> CDS

<222> (46)...(321)

<221> misc_feature

<222> (1)...(584)

<223> n = A,T,C or G

<400> 23

aacgcacgaa acatacacia aacccaagca catcagtaga tcggc atg gcg cac ttc 57
Met Ala His Phe
1

cag gag gtg gac tac tgc tcg gag gag gtg agg gcg gtg ggc tac ccg 105
Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ala Val Gly Tyr Pro
5 10 15 20

gcc cgc cgc ggc tgc ggc ggc gtg cag gag cac atc gtc aag gag acg 153
Ala Arg Arg Gly Cys Gly Gly Val Gln Glu His Ile Val Lys Glu Thr
25 30 35

ttc gtg cag gag ttc gac acc gcc ggc cgc cgc cay ggt cac cac ggt 201
Phe Val Gln Glu Phe Asp Thr Ala Gly Arg Arg Xaa Gly His His Gly
40 45 50

cac cac ggc cgy ggc tcy ggt cac ttc gag gtg cgc gag agc aag cts 249
His His Gly Xaa Gly Xaa Gly His Phe Glu Val Arg Glu Ser Lys Xaa
55 60 65

gar gag gac atc aac acc cgc acc ggs gag ttc cac gaa cgc aag gga 297
Xaa Glu Asp Ile Asn Thr Arg Thr Xaa Glu Phe His Glu Arg Lys Gly
70 75 80

aay ttc tcs tcc aag gcc gat gac trasytwaac ayttmcggac acactacatg 351
Xaa Phe Xaa Ser Lys Ala Asp Asp
85 90

tgtgtawatt mygsattcaa mattatatgt atgtktkatg ttkccamat ccywtacctt 411
tgcaagctkc cttyttggcg gsaacaaccc yatyggtgcsc csttcaacct taataancct 471
ancntgaaca gataaactnc tgatagtntt aaaaaaaggg ggccgtacca atcgctatat 531
ggctctttage cctncggcgt cgttncactc tncgtgaaan ctggtacact tan 584

<210> 24

<211> 92

<212> PRT

<213> Triticum aestivum

<400> 24

Met Ala His Phe Gln Glu Val Asp Tyr Cys Ser Glu Glu Val Arg Ala
1 5 10 15
Val Gly Tyr Pro Ala Arg Arg Gly Cys Gly Gly Val Gln Glu His Ile
20 25 30
Val Lys Glu Thr Phe Val Gln Glu Phe Asp Thr Ala Gly Arg Arg His
35 40 45
Gly His His Gly His His Gly Arg Gly Ser Gly His Phe Glu Val Arg
50 55 60
Glu Ser Lys Leu Glu Glu Asp Ile Asn Thr Arg Thr Gly Glu Phe His
65 70 75 80
Glu Arg Lys Gly Asn Phe Ser Ser Lys Ala Asp Asp

<210> 25
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Designed oligonucleotide based upon an adaptor
used for cDNA library construction and poly(dT) to
remove clones which have a poly(A) tail but no
cDNA insert.

<400> 25
tcgaccacg cgtccgaaaa aaaaaaaaaa aaaaaa

36

10090031-022000